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print. If this interpretation be a correct one, it goes toward fixing the age of the workmanship, and brings it within the historic period of North America.

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*Stated Meeting, October 17, 1884.*

Present, 15 members.

President, Mr. FRALEY, in the Chair.

A letter requesting exchanges was received from Mr. J. C. Rowell, Librarian of the University of California, dated Berkeley, October 1. On motion, the University of California was placed on the list to receive the Transactions and Proceedings from the beginning.

A letter requesting missing numbers of Transactions and Proceedings American Philosophical Society was received from the Imperial Society of Nature, Moscow, dated September 1.

Donations to the Library were reported from the Royal Society of Victoria; the Annales des Mines and Revue Politique; the Royal Academy of History at Madrid; the Meteorological Office, the Journal of Forestry and London Nature; Dr. Edward Jarvis, of Boston; Harvard University; the New York Academy of Sciences; the College of Pharmacy, the Franklin Institute, the Engineers' Club, the American Journal of Medical Sciences, Rev. E. W. Syle, Mr. Henry Phillips, Jr., and L. R. Hamersly, of Philadelphia; the Maryland Historical Society; the Bureau of Education, the United States National Museum and the Surgeon-General's Office at Washington.

A paper on *Herderite* was read by Dr. F. A. Genth.

A paper on the Language and Ethnographic position of the Xinka (Shinka) Indians of Guatemala was read by Dr. D. G. Brinton. The paper embraced two vocabularies of three dialects, the only known existing specimens of the language.

Dr. Syle objected to the statement made in the memoir that the absence of native names of *salt*, *maize*, &c., must necessarily be taken as evidence that the aboriginal Xinkas did not know, or possess the articles until the advent of their Aztec and Maya conquerors; adducing the fact that the

Japanese now use many Chinese names for things which they had before, and for which they had and still have their own names.

Mr. Phillips instanced the adoption of the word "alcohol" by the English, and their abandonment of "spirits of wine."

Dr. Brinton replied that the evidence was made stronger by the foreign words being repeated in all three dialects; and that comparative philologists recognize the rule as a good one, and the inference as reasonable, that if the Xinka vocabularies have no native word for hat, and have instead the Spanish word *sombrero*, the hat was probably not an article of native dress.

Mr. Ashburner described observations at the Luray caverns, and at the Natural Bridge, in Virginia, which he had made recently.

He found by barometric and by direct measurements that the traditional data of the French Engineers were exaggerated. Instead of 215', he made the crown of the arch 185' and 187' above the stream. Instead of the popularly received 2000' above tide, his connections with the nearest railway station made the stream 915', and the crown of the arch 1102' A. T., and the Hotel 1040'. The thickness of the bridge at the north side is 46'; at the south side 36'.

Cedar creek flows beneath the bridge *southward*. The rock of the bridge is nearly horizontal. The rocks north of the bridge dip steeply towards it (*i. e.*, downstream, southward); those south of the bridge dip perceptibly also towards it (*i. e.*, upstream, northward). There is, therefore, a local synclinal at the bridge; and Mr. Ashburner would thus account for the existence of the bridge at that particular point. The last remnant of the roof of a long cavern, following a special stratum across a synclinal, would necessarily be left precisely in the axial line of the trough.

The Luray cavern ramifies to great distances, but always in a particular group of limestone beds, limited to 65 feet. The cavern of the Natural Bridge must have been limited to a certain soluble horizon of the formation. Its great height now is no safe index of the height of the cavern formerly; nor of the width of the soluble rock zone; but is to be ascribed to the vertical erosion of its channel by Cedar creek, in adjusting its water slope to the neighboring open lower country.

Dr. Frazer remarked that when he visited the Bridge three years ago he noticed steep ( $45^{\circ} \pm$ ) dips further south; and therefore that the synclinal must be very local.

Dr. Frazer desired to place on record his dissent from Prof. H. C. Lewis's paper on a great trap range through Southern Pennsylvania, read at the late meeting of the American Association for the Advancement of Science; because the discussion which followed the reading of that paper would not appear in the volume of the Transactions of the Association.